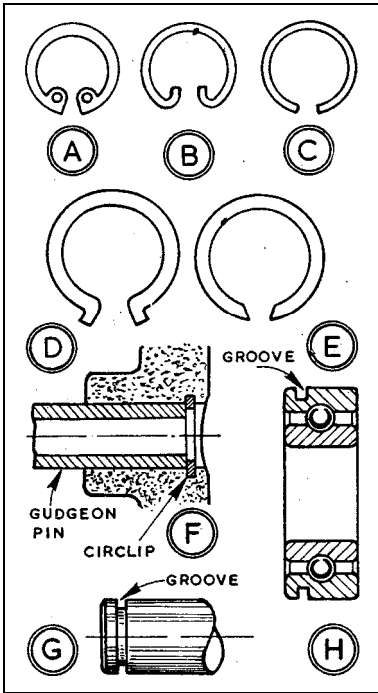


CIRCLIPS

GEOMETER details the removing and fitting of some modern locating devices



in half-round grooves may compress or expand (depending on the application) and push out. Such circlips should always be sunk in their grooves to at least half the diameter of their section. With circlips of soft material, which have to be squeezed into grooves, care must be taken to do this properly.

Common types

Popular types of internal and external circlips are shown at A to E. Type A is of rectangular section to fit a square-sided groove in a bore, and is provided with two holes for compressing with a suitable tool when fitting or extracting. Type B is also for a bore, and of round wire with the ends turned in for manipulating with narrow-jawed pliers. Type C is of round wire and may be fitted in a bore or on a shaft-sprung in or on, and levered and pushed out with a screwdriver blade. All these are hardened and tempered and, consequently, springy.

Type D for external fitting is soft, however, and of rectangular section provided with lugs at the ends for squeezing it into its groove. Type E is also rectangular section, but springy, and for external fitting—its ends being chamfered inwards to permit of easy levering out.

Common uses for type A circlip are for end-locating gudgeon pins in pistons, F, and for similarly locating bushes in needle roller universal joints. The circlip should only be used once, and great care exercised to seat it properly. Type D circlip fits in a groove, G, and is often used for car brake shoe pivots. Type E circlip is employed where a ball race, H, carries a groove in its outer member, the circlip then locating it endwise in the housing.

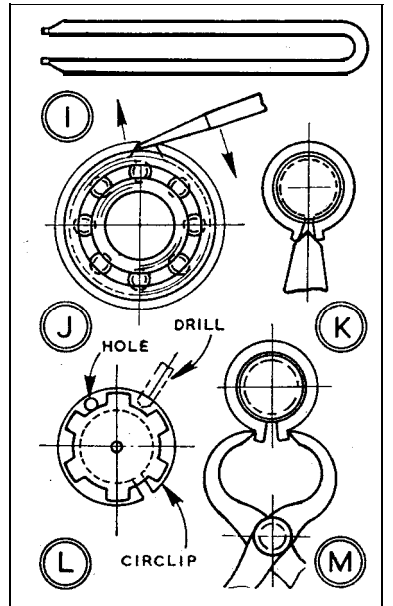
Piston circlips can be manipulated with small round-nosed pliers or a tool, Z, with reduced diameters at the ends to fit in the circlip holes. Full compression and square extraction from the bore are necessary, since accuracy of fitting is such that the circlip cannot be withdrawn askant.

The ball race circlip can be removed as J, using a screwdriver blade under

one of the ends, lifting out an sideways placing another screwdriver behind and working right round. For brake shoe pivot circlips, blunt-ended punch or chisel K, can be used for opening and freeing, and the ends of the circlip tapped with a hammer as if to drive it over the diameter. Then with the circlip loose, it is usually possible to enter a small punch or screwdriver at the back opposite the lugs, and so lever the circlip off.

A stout circlip or locking ring on a splined shaft can prove very difficult to remove. An easy way, however, unless the material is hard, is to drill a hole from the side or above and away from the ends to weaken the circlip, L, until the ends can be levered open with a screwdriver or a blunt chisel used (as K). Careful cutting with a small chisel from the side and above will weaken a circlip.

Fitting of circlips is usually straightforward, taking care they are seating correctly, though the soft type, D, is best squeezed with large pliers or ordinary pincers, M.



NOT SO MANY years ago a circlip as a locating device was something of a rarity, not inspiring full confidence in engineers. Some thought it likely to work loose or jump out of its groove in use, to break from vibration, or soften or distort when subjected to heat—with more or less disastrous results.

Some circlips did, in fact, give trouble—from wrong material, wrong application or fitting. But modern examples are among the simplest and most reliable locating devices, if a few simple rules are followed.

Circlips, like split pins, are advisedly regarded as expendable items and used only once. Where side thrust is likely to be encountered; they should be of rectangular section, seating properly in accurate square-sided grooves. Round section types